Volunteer Lake Assessment Program Individual Lake Reports

MARTIN MEADOW POND, LANCASTER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	960	**Max. Depth (m):**	9.1	**Flushing Rate (yr^{-1}):**	0.9
Surface Area (Ac.):	118	**Mean Depth (m):**	4.1	**P Retention Coef:**	0.71
Shore Length (m):	3,200	**Volume (m^3):**	1,954,000	**Elevation (ft):**	1068

TROPHIC CLASSIFICATION

Year	Trophic class
1994	MESOTROPHIC
2008	MESOTROPHIC

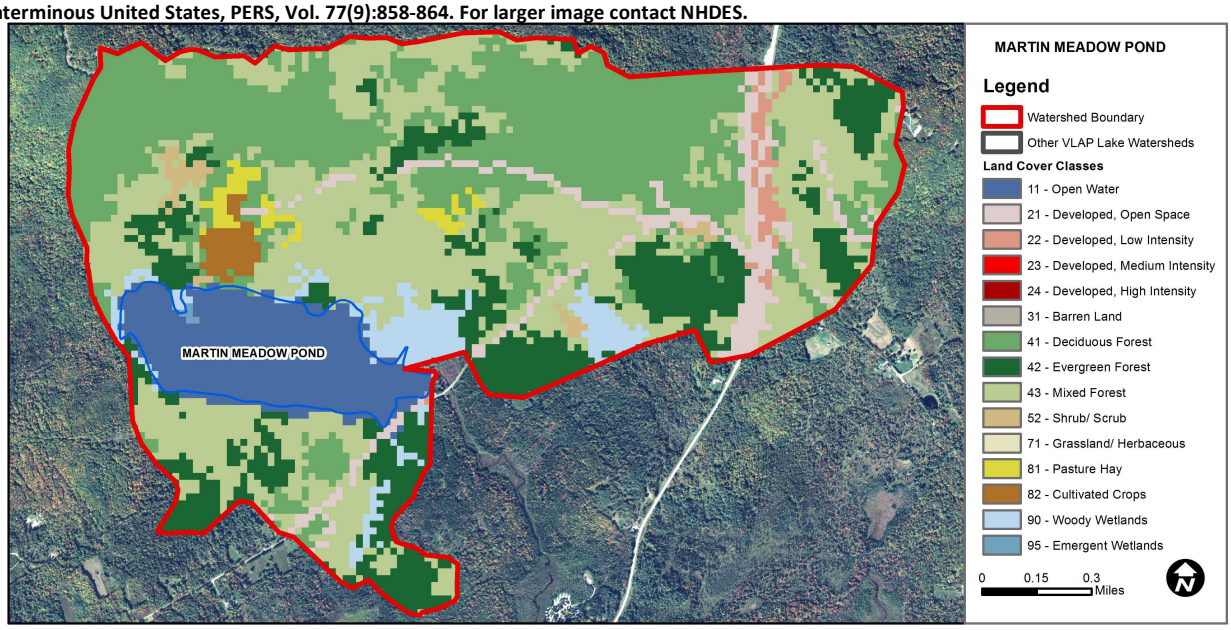
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

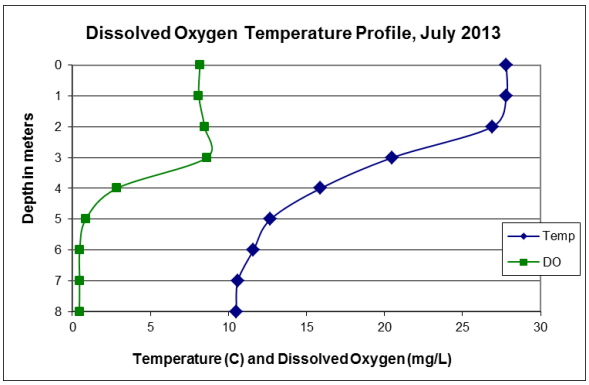


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	9.7	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	4.96	Deciduous Forest	29.52	Pasture Hay	1.17
Developed-Low Intensity	1.06	Evergreen Forest	15.78	Cultivated Crops	1.04
Developed-Medium Intensity	0	Mixed Forest	31.87	Woody Wetlands	4.02
Developed-High Intensity	0	Shrub-Scrub	0.87	Emergent Wetlands	0.08

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
MARTIN MEADOW POND, LANCASTER, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were the lowest measured since monitoring began and much less than the state median. Visual inspection of historical data indicates chlorophyll levels fluctuate from year to year.
- **CONDUCTIVITY/CHLORIDE:** Deep spot, tributary and near shore conductivity levels increased in 2013 and were greater than the state median. Significant spring and early summer storm events may have contributed to the higher conductivity in 2013. Visual inspection of historical data indicates relatively stable epilimnetic (upper water layer) conductivity.
- **E. COLI:** E. coli levels were well below state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were the lowest measured since monitoring began and below the state median. Hypolimnetic (lower water layer) phosphorus levels were elevated potentially due to bottom sediment contamination as turbidity was also elevated. Near shore and tributary phosphorus levels were low. Visual inspection of historical data indicates epilimnetic phosphorus fluctuates from year to year.
- **TRANSPARENCY:** Viewscope transparency was much better than that measured without the viewscope and likely a better representation of actual lake clarity due to variable water surface interferences. Visual inspection of historical data indicates relatively stable transparency.
- **TURBIDITY:** Deep spot turbidity was slightly elevated in the epilimnion and elevated in the hypolimnion. Wind and wave action may have contributed to the slightly elevated epilimnetic turbidity, and bottom sediment and/or organic compounds released during oxygen depleted conditions may have contributed to hypolimnetic turbidity. Near shore and tributary turbidity was low.
- **PH:** pH levels were sufficient to support aquatic life, however have historically been less than desirable range 6.5-8.0 units.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels were depleted below 1.0 mg/L in the hypolimnion indicating the potential for phosphorus and other organic compounds to be released from bottom sediments.
- **RECOMMENDED ACTIONS:** Increase monitoring frequency to once per month during the summer to better assess summer water quality and decrease variability in assessing historical trends. Conduct chloride monitoring to assess impacts on conductivity.



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2013 Averge Water Quality Data for MARTIN MEADOW POND

Station Name	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	16.1	1.42	105.7		8	1.80	3.60	1.54	7.21
Hypolimnion			113.6		18			5.93	7.03
Kendall			105.9	1	5			0.43	7.44
Outlet			106.9	1	6			0.62	7.49
Weeks			104.5	1	6			0.55	7.49
Whithed			105.9	1	5			0.49	7.42

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.